Dendritic cells process antigens encapsulated in a biodegradable polymer, poly(D,L-lactide-co-glycolide), *via* an alternative class I MHC processing pathway

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Biodegradable nanospheres generated from a biocompatible polymer, poly(DL-lactide-co-glycolide) (PLGA), have been studied extensively as implantable reservoirs for sustained-release drug delivery. PLGA-nanospheres have also been studied as vehicles to deliver antigens to phagocytes. The intracellular processing pathway of ovalbumin (OVA) encapsulated with PLGA (OVA-nanosphere) was examined in the present study. In dendritic cells (DCs), class I MHC (MHC-I)-restricted presentation of OVA-nanospheres was resistant to lactacystin, a proteosome inhibitor, and brefeldin A, which blocks anterograde transport from the endoplasmic reticulum (ER) through the Golgi apparatus. Chloroquine, which inhibits phagolysozomal enzymes by increasing phagolysomal pH, also inhibited MHC-I-restricted presentation of OVA-nanospheres. In addition, DCs generated from TAP-/- mice were markedly suppressed in presenting OVA-nanospheres in association with MHC-I molecules. These results demonstrate that DCs process phagocytosed OVA-nanospheres via a vacuolar alternative MHC-I pathway for the presentation of OVA peptides to T lymphocytes.